

F-7906

Ser. No. 10/628,612

CLAIM LISTING OF CLAIM AMENDMENTS AUTHORIZED
DURING JULY 6, 2006, INTERVIEWOK TO ENTER
OR
7-6-2006

1. (Canceled)

2. (Currently Amended) A method of winding a strip member on a drum of a tire building machine in a winding operation building a tire, comprising:

providing a first strip end sensor directed at said drum ~~in a direction~~ at a first position along a path of rotational advance of a surface of said drum which is angularly displaced along [[a]] said path of rotational advance of said drum from an angular position along said path of rotational advance whereat said strip member is brought into initial contact with said drum in order to detect a first detection position on said surface of said drum whereat said strip member is brought into initial contact with said drum;

providing a second strip end sensor directed at a second position along said path of rotational advance of said surface of said drum [[and]] which is angularly displaced from said first position along said path of rotational advance at which said first strip end sensor is directed;

providing [[a]] an angle detector to detect an angle of rotation of said drum;

rotating said drum in a drum rotational direction while delivering a front end of said strip member to said drum to begin wrapping said strip member on said drum;

F-7906

Ser. No. 10/628,612

detecting said front end of said strip member at said first detection position using said first strip end sensor and initiating a first angular measurement using said angle detector;

detecting arrival of said front end of said strip member at said second strip end sensor;

completing said first angular measurement using said angle detector and initiating a second angular measurement when said front end of said strip member is detected by said second strip end sensor and continuing to rotate said drum in said drum rotational direction;

calculating a first angle representing angular displacement from said second strip end sensor to said first strip end ~~sensor~~ sensor in the drum rotational direction based on output from said angle detector;

detecting arrival of a trailing end of said strip member at said first strip end sensor brought about by rotating said drum in said drum rotational direction;

completing said second angular measurement using said angle detector when said trailing end of said strip member is detected by said first strip end sensor to yield a second angle; and

calculating an overlap length if said second angle is greater than said first angle and calculating a gap length if said second angle is less than said first angle.

3. (Currently Amended) The method of claim 2 wherein:

F-7906

Ser. No. 10/628,612

said overlap length is calculated using the formula

$$X=(D + 2t)\pi \times ((\theta_1 - \theta_0)/360)$$

when said second angle is greater than said first angle, where:

X =said overlap length;

D =a diameter of said drum;

t =a thickness of said strip member;

θ_0 = said first angle; and

θ_1 = said second angle; and

said gap length is calculated using the formula

$$Y=(D + 2t)\pi \times ((\theta_0 - \theta_2)/360)$$

when said first angle is greater than said second angle and where θ_2 equals said second angle and Y equals said gap length.

4. (Previously Presented) The method of claim 3 further comprising:

determining whether one of said overlap length and said gap length is outside an allowable range; and

stopping the winding operation of the tire in response to said one of said overlap length and said gap length being determined to be outside said allowable range.

F-7906

Ser. No. 10/628,612

5. (Previously Presented) The method of claim 3 further comprising:
determining whether one of said overlap length and said gap length is outside
an allowable range; and
sounding an alarm in response to said one of said overlap length and said gap
length being determined to be outside said allowable range.

6. (Previously Presented) The method of claim 2 further comprising:
determining whether one of said overlap length and said gap length is outside
an allowable range; and
stopping the winding operation of the tire in response to said one of said
overlap length and said gap length being determined to be outside said allowable
range.

7. (Previously Presented) The method of claim 2 further comprising:
determining whether one of said overlap length and said gap length is outside
an allowable range; and
sounding an alarm in response to said one of said overlap length and said gap
length being determined to be outside said allowable range.

8. (Currently Amended) A method of winding a strip member on a drum of
a tire building machine, comprising:

F-7906

Ser. No. 10/628,612

providing a first strip end sensor directed at a first detection position on said drum whereat said strip member is brought into initial contact with said drum;

providing a second strip end sensor directed at said drum and angularly displaced from said first strip end sensor;

providing ~~[[a]]~~ an angle detector to detect an angle of rotation of said drum;

rotating said drum in a drum rotational direction while delivering a front end of said strip member to said drum to begin wrapping said strip member on said drum;

detecting said front end of said strip member using said first strip end sensor and initiating a first angular measurement using said angle detector;

detecting arrival of said front end of said strip member at said second strip end sensor;

completing said first angular measurement using said angle detector and initiating a second angular measurement when said front end of said strip member is detected by said second strip end sensor and continuing to rotate said drum in said drum rotational direction;

calculating a first angle representing angular displacement from said second strip end sensor to said first strip end ~~sensor~~ sensor in the drum rotational direction based on output from said angle detector;

detecting arrival of a trailing end of said strip member at said first strip end sensor brought about by rotating said drum in said drum rotational direction;

F-7906

Ser. No. 10/628,612

completing said second angular measurement using said angle detector when said trailing end of said strip member is detected by said first strip end sensor to yield a second angle;

calculating an overlap length if said second angle is greater than said first angle and calculating a gap length if said second angle is less than said first angle;

determining whether one of said overlap length and said gap length is outside an allowable range; and

sounding an alarm in response to said one of said overlap length and said gap length being determined to be outside said allowable range.

9. (Currently Amended) The method of claim 8 wherein:

said overlap length is calculated using the formula

$$X=(D + 2t)\pi \times ((\theta_1 - \theta_0)/360)$$

when said second angle is greater than said first angle, where:

X=said gap overlap length;

D=a diameter of said drum;

t= a thickness of said strip member;

θ_0 = said first angle; and

θ_1 = said second angle; and

said gap length is calculated using the formula

F-7906

Ser. No. 10/628,612

$$Y=(D+2t)\pi \times ((\theta_0 - \theta_2)/360)$$

when said first angle is greater than said second angle and where θ_2 equals said second angle and Y equals said gap length.

10. (Currently Amended) A method of winding a strip member on a drum of a tire building machine, comprising:

providing a first strip end sensor directed at a first detection position on said drum whereat said strip member is brought into initial contact with said drum;

providing a second strip end sensor directed at said drum and angularly displaced from said first strip end sensor;

providing $[[a]]$ an angle detector to detect an angle of rotation of said drum;

rotating said drum in a drum rotational direction while delivering a front end of said strip member to said drum to begin wrapping said strip member on said drum;

detecting said front end of said strip member using said first strip end sensor and initiating a first angular measurement using said angle detector;

detecting arrival of said front end of said strip member at said second strip end sensor;

completing said first angular measurement using said angle detector and initiating a second angular measurement when said front end of said strip member is detected by said second strip end sensor and continuing to rotate said drum in said drum rotational direction;

F-7906

Ser. No. 10/628,612

calculating a first angle representing angular displacement from said second strip end sensor to said first strip end ~~sensor~~ sensor in the drum rotational direction based on output from said angle detector;

detecting arrival of a trailing end of said strip member at said first strip end sensor brought about by rotating said drum in said drum rotational direction;

completing said second angular measurement using said angle detector when said trailing end of said strip member is detected by said first strip end sensor to yield a second angle;

calculating an overlap length if said second angle is greater than said first angle and calculating a gap length if said second angle is less than said first angle;

determining whether one of said overlap length and said gap length is outside an allowable range; and

stopping the winding operation of the tire in response to said one of said overlap length and said gap length being determined to be outside said allowable range.

11. (Currently Amended) The method of claim 10 wherein:

said overlap length is calculated using the formula

$$X=(D+2t)\pi \times ((\theta_1 - \theta_0)/360)$$

when said second angle is greater than said first angle, where:

X=said ~~[[gap]]~~ overlap length;

F-7906

Ser. No. 10/628,612

D =a diameter of said drum;

t = a thickness of said strip member;

θ_0 = said first angle; and

θ_1 = said second angle; and

said gap length is calculated using the formula

$$Y=(D + 2t)\pi \times ((\theta_0 - \theta_2)/360)$$

when said first angle is greater than said second angle and where θ_2 equals said second angle and Y equals said gap length.